

## AMENDMENTS TO CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Currently Amended) A high speed search method in a speech encoder using an order character of LSP (Line Spectrum Pair) ~~coefficients parameters in a~~ an LSP count parameter quantizer using SVQ (Split Vector Quantization) used in a low-speed transmission speech encoder, the high-speed search method comprising the steps of:

rearranging a first codebook by replacing the first codebook with a new codebook in which a number of code vectors in the new codebook are arranged in an order according to an element value of a reference row of the first codebook for determining a range of code vectors to be searched; and

determining a search range by using an order character between a given target vector and an arranged code vector to obtain an optimal code vector.

2. (Currently Amended) The high-speed search method as claimed in claim 1, wherein the rearranging step comprises the steps of:

selecting the reference row in ~~each~~ the first codebook by using a plurality of voice data, and then determining an optimal arrangement position (Nm) in which an average search range is minimized; and

replacing the first codebook with a ~~the~~ new codebook in which a number (Lm) of code vectors in the new codebook are arranged in a descending order according to ~~an~~ the element value of ~~the a~~ selected said reference row.

3. (Currently Amended) The high-speed search method as claimed in claim 1, wherein the code vector-obtaining step comprises the step of:

determining the search range by forward and backward comparison of the element value of the reference row in the ~~arranged-first~~ codebook and element values of ~~rows positions~~ before and after ~~the a reference position in the~~ target vector; and

obtaining an error criterion ( $E_{l,m}$ ) having high computational complexity by using the ~~below Equation 2 following equation~~ only within the determined search range:

$$E_{l,m} = (\mathbf{p}_m - \mathbf{p}_{l,m})^T \mathbf{W}_m (\mathbf{p}_m - \mathbf{p}_{l,m})$$

$$0 \leq m \leq M - 1$$

$$1 \leq l \leq L_m$$

where  $l, m$  in the subscript of  $E_{l,m}$  are indices that represent the  $l$ th index of the  $m$ th codebook, i.e., the letters “ $l$ ” and “ $m$ ,” and

where superscript T designates the transpose of  $(\mathbf{p}_m - \mathbf{p}_{l,m})$  for purposes of determining the dot product of  $(\mathbf{p}_m - \mathbf{p}_{l,m})$  and  $\mathbf{W}_m (\mathbf{p}_m - \mathbf{p}_{l,m})$  in order to calculate the least-mean-square error  $E_{l,m}$ .

4. (Currently Amended) The high-speed search method as claimed in claim 3,

wherein the search range is an average number with which an element value of the  $n^{\text{th}}$  row in the ~~arranged-first~~ codebook and element values in the  $n+1^{\text{th}}$  and  $n-1^{\text{th}}$  positions of the target vector satisfy the order character.

5. (Currently Amended) A high-speed search method in the G.729 fixed codebook with decreased computational complexity without loss of tone quality, the high-speed search method comprising the steps of:

arranging position indexes of ~~tracts~~ tracks ( $t_0, t_1, t_2$ ) in a descending order according to a correlation level ( $d'(n)$ );

determining a range to search a ~~tract~~ track ( $t_3$ ) according to the indexes arranged in a descending order; and

canceling the detecting and searching processes which ~~has~~ have a low probability.

6. (Currently Amended) The high-speed search method in the G.729 fixed codebook as claimed in claim 5, wherein the arranging step comprises the step of:

comparing correlation vectors of all of ~~the~~ pulse position indexes in each track to ~~arranging~~arrange the position indexes in a descending order.

7. (Currently Amended) The high-speed search method in the G.729 fixed codebook as claimed in claim 5, wherein the search range-determining step comprises the steps of:

adding correlation values of each pulse position index for ~~the~~a pulse position index combination of the tracks ( $t_0$ ,  $t_1$ ,  $t_2$ ); and

comparing ~~the~~an added result with a threshold ( $C_{th}$ ) determined before ~~the search of~~ searching the fixed codebook to search track ( $t_3$ ) using ~~an~~the added result more than the threshold.

8. (Currently Amended) The high-speed search method in the G.729 fixed codebook as claimed in claim 5, wherein the canceling step comprises the step of:

canceling the searching process for the range where ~~the~~an added result is less than ~~the~~ a threshold.